

# **EXHIBIT N**

THE JOURNAL OF FINANCE • VOL. XXXVII, NO. 6 • DECEMBER 1982

## An Analysis of the Impact of Deposit Rate Ceilings on the Market Values of Thrift Institutions

LARRY Y. DANN and CHRISTOPHER M. JAMES\*

### ABSTRACT

This paper examines the impact of changes in deposit interest rate regulations on the common stock values of savings and loan institutions. The analysis indicates that stockholder-owned savings and loans (S & L's) have experienced statistically significant declines in equity market values at the announcement of the removal of ceilings on certain consumer (small saver) certificate accounts and the introduction of short term variable rate money market certificates. We find the evidence to be consistent with the hypothesis that S & L's have earned economic rents from restrictions on interest rates paid to small saver accounts, and that relaxation of interest rate ceilings has reduced these rents.

A CENTRAL ISSUE in the economics of regulation is whether regulators behave in a way that primarily benefits the economic agents whose actions they are supposed to regulate. The proposition that regulation is demanded and acquired by the regulated, and that regulations are designed and administered primarily for their benefit was originally put forth by Stigler [19], and has come to be known as the "capture" theory of regulation. An alternative view is that regulators adopt policies which serve some other (perhaps "public," or possibly the regulators' own) interest, and that administration of these policies does not benefit the regulated entities. This paper examines the regulation of savings and loan associations' deposit interest rates and reports evidence pertaining to the impact of the administration of regulation.

Regulation of interest rates paid to depositors in federally insured savings and loan associations began in 1966. Since that time, several changes in the maximum allowed interest rates (deposit rate ceilings) have been made. These changes present an opportunity to observe the impact of one form of regulatory action on savings and loan institutions.

Deposit rate regulation has been the subject of extensive previous research. The empirical investigations have focused primarily on two issues: (1) the allocational efficiency and wealth redistribution effects of rate ceilings; and (2) the impact of deposit rate ceilings on the flow of funds into the residential

\* University of Oregon, and the University of Oregon and the Office of the Comptroller of the Currency, respectively. The authors thank Kathi Martell for computational assistance, and Michael Brennan, James Brickley, Michael Hopewell, Edward Kane, George Kaufman, Ronald Masulis, David Mayers, Wayne Mikkelsen, George Racette, and the referee, Richard Ruback, for helpful suggestions. The views expressed in this paper are those of the authors and do not necessarily reflect those of the Office of the Comptroller of the Currency.

mortgage market.<sup>1,2</sup> To our knowledge, no empirical study has examined the impact of deposit rate regulation on the value of savings and loan institutions. That an investigation of this sort has not heretofore been done is somewhat surprising, since if savings and loan associations (hereafter referred to as S & L's or "thrifts") receive net benefits from regulation of deposit rates, these benefits should be capitalized in the price of ownership claims to these institutions. Consequently, our examination has the potential to discriminate between the conflicting theories of regulation, at least insofar as they apply to depository institutions. In addition, recent legislation directed at deregulation and Congressional concern over the impact of deregulation on the earnings and viability of the thrift industry has made the effect of ceilings on thrift rates a topic of particular interest.<sup>3</sup>

In this paper, the impact of deposit rate regulation changes on the common stock values of thrift institutions is investigated. To measure the valuation effects associated with regulation, the common stock price performance of S & L's is examined around the announcement date of ceiling rate changes. Concentrating on security price performance around regulatory changes is an approach that is common to several previous studies of the wealth effects associated with regulation.<sup>4</sup>

The major finding of this paper is that stockholder-owned thrift institutions have experienced statistically significant declines in value at the announcement of the removal of ceilings on certain consumer (small saver) certificate accounts and the introduction of short term variable rate money market certificates. No decline in value was experienced following the removal of ceilings on certificates of deposit of over \$100,000. For none of the regulatory changes that we examine did prices of S & L shares show a statistically significant increase. Our findings are consistent with the hypothesis that thrifts have earned rents on consumer accounts because of the existence of deposit rate ceilings. However, we find no evidence that is consistent with the hypothesis that regulatory action subsequent to the imposition of ceilings has conferred benefits upon the regulated industry.

In Section I, we present competing hypotheses regarding the effect on S & L stock values of relaxing interest rate ceilings on deposits. The specific regulatory changes studied and the data used to test the hypotheses are described in Section II. The empirical methodology that we utilize is presented in Section III. Results

<sup>1</sup> See Pyle [14], Kane [10], and Clotfelder and Lieberman [2] for an analysis of the distributional effects of ceilings. These studies focus primarily on the interest income lost by small savers. These papers do not, however, address the question of who gains from the rate ceilings.

<sup>2</sup> At the same time that ceilings were imposed on S & L deposit rates, ceilings on deposit rates offered by commercial banks were lowered to rates below the S & L ceilings. An important stated purpose of this action was to direct the flow of deposits into thrift institutions and through their role as mortgage lenders increase the supply of residential mortgages. See Jaffee and Rosen [6] for a discussion of the impact of ceilings on the supply of mortgages.

<sup>3</sup> The Depository Institutions Deregulation and Monetary Control Act was passed in March 1980. It mandates the removal of all deposit rate ceilings by 1986. The Depository Institutions Deregulation Committee was established by the act to manage the deregulation process. In Congress's direction to the Committee concern with the impact of deregulation on the profitability and "viability" of depository institutions, particularly thrift institutions, is explicitly stated. (Sec. 2046).

<sup>4</sup> See Jaffe [5], Schwert [17], [18], Jarrell and Bradley [8], and Ruback [15].

of the investigation are reported in Section IV. Section V contains an interpretation of the results and our conclusions.

### I. Alternative Hypotheses Regarding the Impact of Ceiling Rate Changes on the Value of Thrift Institutions

One hypothesis is based on the premise that the existence of binding constraints on interest rates paid to depositors confers monopoly rents upon thrift institutions.<sup>5</sup> This argument generally proceeds as follows. Some suppliers of capital (potential depositors) restrict their choice of investment medium for at least a portion of their wealth to federally insured depository institutions (commercial banks and S & L's).<sup>6</sup> Constraining deposit interest rates to a level below that which depository institutions would be willing to pay subsidizes depository institutions at the expense of depositors. Moreover, by limiting the value of other services that depository institutions can offer, regulators assure that the subsidy arising from restricting price (interest rate) competition is not fully dissipated via nonprice competition.<sup>7</sup> In essence, deposit interest rate ceilings, along with restrictions on nonprice competitive behavior, serve as a form of government administered price fixing agreement. In this scenario, a relaxation of the interest rate constraint reduces the subsidy to the thrift institution, and by implication the value of the thrift.<sup>8,9</sup> We refer to this as the *Subsidy Reduction Hypothesis*. The subsidy reduction hypothesis predicts that the relaxation of ceiling rates on existing deposits or the introduction of new deposit instruments which have no ceiling rates results in a decline in the value of thrift institutions.

A second hypothesis regarding the impact of regulatory change on the value of S & L's is a variant of the *Producer Protection Hypothesis* originally posited by Stigler [19] and Jordan [9]. This hypothesis states that regulatory agencies, once in place, are "captured" by the entities whose actions they are supposed to regulate, and that as a consequence the producers receive net benefits from the

<sup>5</sup> Pyle suggests that increased profitability of depository institutions has resulted from the imposition of maximum interest rate regulation. Taggart [20] agrees that thrifts earn rents from the existence of deposit rate ceilings, but concludes that a portion of the rents has been dissipated through operating expenses in excess of "competitive levels."

<sup>6</sup> These investors restrict their choice for a variety of reasons, including risk aversion, convenience, lack of sufficient resources to meet minimum initial investment requirements elsewhere, etc.

<sup>7</sup> Restrictions on interstate "branching" activity and maximum limits on premiums which institutions can offer to attract deposits are examples of restrictions on noninterest payments.

<sup>8</sup> In addition to imposing interest rate ceilings, the Interest Rate Adjustment Act of 1966 specified a higher permissible maximum rate for savings and loans than for commercial banks. This difference in ceiling rates between S & L's and commercial banks (CB's) has come to be commonly referred to as the "differential." The relative impacts on the value of S & L's and CB's resulting from ceiling changes are not examined here. A companion study in progress by one of the authors examines the relative value changes of S & L's and CB's resulting from changes in ceilings and changes in the "differential."

<sup>9</sup> The existence of monopoly rents that arise from competition restrictions among thrifts does not by itself ensure that these rents augment the value of the institutions. The rents may be captured by managers of thrifts in the form of supracompetitive salaries and other employment perquisites. We assume that the market for managers is sufficiently competitive that at least some of the rents accrue to the owners of the thrift institutions.

administration of government regulation.<sup>10</sup> Applied to thrift institutions, the major proposition of the producer protection hypothesis is that selectively raising ceilings on certain types of deposits results in a net inflow of funds to thrift institutions and thereby contributes to the long-run earnings of thrifts. The underlying rationale of the producer protection hypothesis is that relaxing the ceiling constraint on certain types of deposit instruments prevents the outflow of resources (disintermediation) from depository institutions that would otherwise occur as the difference between market interest rates and ceiling rates increases. Moreover, by selectively relaxing ceilings (and permitting the introduction of additional types of deposit instruments), the regulatory agencies allow S & L's to differentiate among depositors based upon their interest elasticity of demand for deposits. In particular, the producer protection hypothesis argues that selective ceiling changes have allowed S & L's to maintain and attract relatively interest-sensitive sources of deposits while discriminating against less interest-sensitive sources of deposits, and therefore have not adversely affected the earnings of thrifts.<sup>11</sup> Instead, ceiling adjustments have been designed to permit thrift institutions to compete with unregulated, nondepository institutions while not forfeiting the subsidy on all deposit accounts. The prediction of the producer-protection hypothesis is that observed increases in interest rate ceilings and the introduction of new account categories have not resulted in a decline in the value of thrifts.<sup>12</sup>

A third hypothesis, which we refer to as the *Ceiling Circumvention Hypothesis*, posits that whatever subsidies thrift institutions might receive from restrictions upon price competition are fully dissipated through nonprice competition so that depositors receive the equivalent of the full-market interest rate. This view has been advanced by Kane [11]. This hypothesis predicts that altering interest rate ceilings will have no impact on the value of savings and loan institutions.

## II. The Data

To test these competing hypotheses, common stock daily rates of return for thirty-four savings and loan associations are examined around each of three deposit-rate ceiling changes that occurred during the period 1973 to 1978. This sample constitutes all actively traded S & L's contained on the Data Resources

<sup>10</sup> We distinguish between the effects of the original imposition of government regulation and the subsequent administration of the regulations. Imposing regulations on a previously unregulated firm may well reduce the value of that firm, but it does not necessarily follow that all subsequent regulatory actions will be value-reducing. An extension and elaboration of this point is found in Peltzman [13]. Peltzman argues persuasively that the regulators' constituency cannot in general be limited to one economic interest. In light of Peltzman's proposition, it is important to emphasize that the issue addressed in this paper is whether the regulated industry *on balance* benefits from regulatory changes in deposit rate ceilings.

<sup>11</sup> This argument is made by Jaffee and Rosen [7].

<sup>12</sup> The behavior of thrift institutions is regulated in several ways and by different agencies. The hypothesis here is that the regulatory group responsible for setting interest rate ceilings operates in the interest of the thrift institutions.

*Deposit Rate Ceilings*

1263

DRI-SEC file.<sup>13, 14</sup> The DRI-SEC file contains daily trading statistics and information on dividends since 1968 for all NYSE and AMEX listed stocks and since January 1972 for stocks traded Over-the-Counter.

Rates of return to S & L stockholders are examined for two principal reasons. First, we assert that the observed market values of S & L shares incorporate the capitalized value of the expected future rents arising from deposit rate ceilings. Moreover, substantial and compelling evidence exists which suggests that security prices "efficiently" impound changes in expected future cash flows.<sup>15</sup> Second, it is likely to be much easier to detect the effects (if any) of ceiling changes in the market price of S & L shares than in nonmarket variables such as S & L accounting earnings.<sup>16, 17</sup>

The three ceiling changes occurring during the 1973 to 1978 period which we investigate each involve either the relaxation of the ceiling rate on an existing deposit instrument or authorization to introduce a new deposit instrument. Details of each of the three regulatory change events are provided in Table I. The announcement date represents the date that the announcement was first published in the *American Banker*.<sup>18</sup> The announcement date is not necessarily the date on which the regulatory change became effective. For the May 1978 introduction of short-term variable rate money market certificates (MMC's) the announcement preceded the effective date.

This study investigates only regulatory changes occurring during the 1973-78 period for two reasons; first, daily price information prior to 1972 was not available for most S & L issues. Nineteen of the thirty-four S & L issues contained in the DRI-SEC file were traded over the counter in 1978 and thus share price data for these firms are not available prior to 1972.<sup>19</sup> Second, regulatory changes occurring

<sup>13</sup> All common stocks in the DRI-SEC file for firms with SIC numbers between 6120 and 6129 were used. These companies were crosschecked with *Moody's Banking and Finance Manual* to insure that each firm's primary line of business was that of a savings and loan association.

<sup>14</sup> Thirty-eight S & L issues were contained in the DRI file. However, four were eliminated because of infrequent trading (five or more nontrading days during the analysis period). While inclusion of these issues does not affect our basic results, they were excluded to avoid possible biases caused by nonsynchronous trading. See Dimson [3] and Scholes and Williams [16] for a description of some of the econometric difficulties caused by nonsynchronous trading.

<sup>15</sup> See Fama [4] for a discussion and summary of the "efficient markets" literature.

<sup>16</sup> This point is made by Schwert [17].

<sup>17</sup> Difficulties in identifying the effects of regulatory change are further compounded if S & L's organized as mutual associations are examined. Whereas one can justify focusing the analysis on earnings or share price for stockholder owned S & L's by invoking the conventional shareholder wealth maximization objective function, no similar justification exists for mutual associations where alternative objective functions may govern behavior.

<sup>18</sup> These dates were crosschecked with the *Wall Street Journal*. Issues of the *American Banker* for the 30-day period prior to announcement were examined to determine whether prior public announcement of regulatory changes were made. For all events examined, no prior published report appeared.

<sup>19</sup> Although the original imposition of deposit rate ceilings might be an interesting and important event to study, we have not done so for two important reasons. One is that reliable daily stock return data around this event are not readily available for most S & L's (the DRI-SEC file does not contain data for this period). A second reason is that, as mentioned earlier, the introduction of ceilings on S & L's was accompanied by a lowering of the ceiling rate permitted by commercial banks. Therefore, the impact of invoking the rate differential is confounded with the impact of the introduction of S & L ceilings.

Table I  
Major Ceiling Rate Changes 1973 to 1978

Announcement Date	Regulatory Change
5/16/73	Ceilings suspended on certificates of deposit of \$100,000 or more with a maturity of 90 days or more.
7/5/73	Ceilings removed on certificates of \$1,000 or more with a maturity of 4 years or more. These certificates have become known as "Wild Card" certificates. Passbook savings rates increased $\frac{1}{4}$ of a point to $5\frac{1}{4}$ percent.
5/11/78	Money Market certificate with ceiling tied to the average rate on new issues of 6-month Treasury bills introduced. In addition, an 8-year certificate with a fixed 8 percent ceiling introduced.

after May 1978 are not investigated because of the high frequency and close spacing of ceiling changes. For example, five changes in the rate structure were announced during the spring of 1979. In addition, in the fall of 1979, the Depository Institution Act was under consideration by Congress. The provisions of this Act were passed as part of PL 96-221, the Depository Institutions Deregulation and Monetary Control Act in March 1980. Identifying specific dates of regulatory changes and predicting price performance during the 1979-80 period was, therefore, not reliable.

Measurement of the effect of ceilings changes during the 1973-78 period was facilitated by the fact that regulatory agencies acted, in most cases, without prior public announcement.<sup>20</sup> Therefore, the main problem encountered in many studies of the impact of regulatory change, that the announced change has been to a substantial degree anticipated by the end of the prolonged regulatory deliberation process, is in large part avoided in this study. In only one instance during the 1973-78 period were ceilings changed as a result of legislative action: the reimposition of ceilings on \$1,000, four-year certificates in November 1973. Because of the difficulty in identifying a date for this change, the effect of reimposing ceilings is not investigated.

### III. Methodology

The methodology used in this paper to measure security price performance is based on the widely used single factor market model. The market model posits a linear relationship between the rate of return on security  $j$  and the rate of return on a market portfolio.<sup>21</sup>

The market model is expressed as

$$\tilde{R}_{jt} = \alpha_j + \beta_j \tilde{R}_{mt} + \tilde{\epsilon}_{jt} \quad (1)$$

<sup>20</sup> As discussed below, there is evidence that regulatory changes, particularly the introduction of MMC's, were anticipated by the market.

<sup>21</sup> See Fama [4, Ch. 3 and 4] for a discussion of this model. We use the CRSP Equal-Weighted Daily Returns Index as the market return in all of our market model regressions.

where

$$\begin{aligned}\bar{R}_{jt} &= \text{rate of return on security } j \text{ over period } t \\ \bar{R}_{mt} &= \text{rate of return on an equally-weighted market portfolio over period } t \\ \beta_j &= \text{cov}(\bar{R}_{jt}, \bar{R}_{mt}) / \text{VAR}(\bar{R}_{mt}) \\ \alpha_j &= E(\bar{R}_{jt}) - \beta_j E(\bar{R}_{mt}) \\ \tilde{\epsilon}_{jt} &= \text{disturbance term of security } j \text{ over period } t, \text{ and } E(\tilde{\epsilon}_{jt}) = 0\end{aligned}$$

The disturbance term,  $\tilde{\epsilon}_{jt}$ , is interpreted as a measure of the abnormal return to the owners of security  $j$  for period  $t$ . It is an abnormal return in the sense that it represents the deviation of the return on the security from its expected return, given the return on the market index during the period. In applying the market model, it is useful (and customary) to designate two time periods relevant to the measurement of security price performance. One time period, which we refer to as the *analysis period*, represents the period of time surrounding the economic event (e.g., announcement of a regulatory change) under study. Detection of abnormal security price performance presumably attributable to the economic event is confined to the analysis period. A second (and distinct) time period, herein labeled the *estimation period*, constitutes the period of time from which estimates of market model parameters  $\alpha_j$  and  $\beta_j$  are obtained. The estimation period is generally selected as a period of time "close" to the analysis period, but one in which no effects on security prices of the economic event under study are expected to occur. Given market model parameter estimates  $\hat{\alpha}_j$  and  $\hat{\beta}_j$  from the estimation period, *prediction errors*,  $PE_{jt}$ , for each firm  $j$  for each period  $t$  within the analysis period are calculated as follows:

$$PE_{jt} = R_{jt} - \hat{\alpha}_j - \hat{\beta}_j R_{mt} \quad (2)$$

The prediction error  $PE_{jt}$  is an estimate of the abnormal return to owners of security  $j$  for period  $t$ .

Although the market model methodology just described is generally applied to individual securities, it can be applied equally well to linear combinations (portfolios) of securities. Because announcements of regulatory change affect all firms in the sample simultaneously, for statistical reasons explained below we utilize the portfolio approach in this study.<sup>22</sup> When the same economic event (e.g., a stock split or a tender offer) is experienced by several firms, each at a different point in calendar time, it is generally reasonable to presume that the returns or prediction errors for each firm on a given date relative to its event date (i.e., on a common date in "event" time) are cross-sectionally uncorrelated. Consequently, conventional tests of statistical significance which rely upon the independence of sample observations are applicable. However, it is unlikely that market model prediction errors of firms in the same industry are contemporaneously uncorrelated.<sup>23</sup> The implication of event-date clustering is that security-specific performance measures and tests for abnormal performance based upon a cross-sectional average of these contemporaneously correlated measures will reject too frequently

<sup>22</sup> Brown and Warner [1] refer to the simultaneous occurrence of sample firms' event dates as "event-date clustering."

<sup>23</sup> See King [12] for evidence of industry influences.

the null hypothesis of no abnormal performance.<sup>24</sup> To overcome the potential statistical problems created by event-date clustering, we form an equally-weighted portfolio of S & L common stocks. The portfolio return,  $R_{pt}$ , and its associated prediction error,  $PE_{pt}$ , directly incorporate the cross-sectional dependence of the component securities.<sup>25</sup> Consequently, tests of significance conducted on portfolio return characteristics are appropriate.<sup>26</sup>

For each regulatory change investigated, our analysis period spans the 26 day period from 15 trading days before the announcement date (Day 0) through 10 trading days following the announcement date.<sup>27</sup> Our estimation period consists of the 60 trading days before and 60 trading days after the analysis period for each regulatory change.<sup>28, 29</sup> For the MMC, Wild Card and CD events, estimated portfolio betas from the 120 day estimation periods are 1.06, 1.30, and 1.16, respectively. We also examined the data for structural differences in the market model relationships before and after the event date by including in the market model a dummy variable indicating whether the estimation period observation came from the pre-event or post-event period. These regressions indicate that no significant changes in beta coefficients occurred at the times of these events.

#### IV. Empirical Results

The prediction errors ( $PE$ ) and cumulative prediction errors ( $CPE$ ) of the portfolio of S & L common stocks are presented in Part A of Table II for the 21-day period centered around announcement of each regulatory change. For the introduction of money market certificates (MMC's) and Wild Card certificates the prediction errors on Day 0 are each  $-1.27\%$ . In contrast, the removal of ceilings on large certificates of deposit (CD's) are accompanied by a prediction

<sup>24</sup> Intuitively, if the prediction error for security  $j$  is large by chance, then with positive contemporaneous correlation the others are also likely to be large.

<sup>25</sup> The portfolio prediction error,  $PE_t$ , and estimated market model parameters  $\alpha$  and  $\beta$  are averages of the corresponding values for the individual securities.

<sup>26</sup> Moreover, unless individual security prediction errors are perfectly positively correlated, the standard deviation of the portfolio prediction errors is less than a weighted average of the standard deviations of the individual security prediction errors. Therefore, utilizing the portfolio market model approach generally increases the efficiency of the test statistic.

<sup>27</sup> The reason for our analysis period not being symmetric around Day 0 is explained below.

<sup>28</sup> For the 1978 MMC event, we replicated our methodology using for our estimation period 100 trading days before and 100 trading days after the analysis period. The results of this analysis are virtually identical to the results reported in the paper. We limit our estimation period for market model parameters to 60 days on either side of the analysis period because, for the 1973 Wild Card introduction, extension of the estimation period beyond 60 trading days past our analysis period would encompass the time period when legislation to abolish Wild Card certificates was initially introduced in Congress. We suspect that this legislative action disrupted the normal relationship that we seek to estimate between S & L stock returns and the market. For the sake of methodological comparability, we therefore employ corresponding estimation periods of 120 days for the large CD and MMC events as well.

<sup>29</sup> The large CD and Wild Card events are 34 trading days apart. To avoid having the abnormal performance of one event contaminate the estimated market model parameters for the other event, we have estimated market model coefficients for these events using 60 daily returns on either side of the analysis period, excluding the days corresponding to the analysis period of the adjacent event.

## Deposit Rate Ceilings

1267

**Table II**  
**Prediction Errors and Test Statistics at Announcement of Interest**  
**Rate Ceiling Changes**

**A. Percentage Daily Prediction Errors (PE) and Cumulative Prediction Errors (CPE) for Portfolio of 34 Stock Savings and Loan Associations for 10 Days Before and After the Public Announcement of Ceiling Changes**

Trading Day	1978 MMC		1973 Wild Card		1973 Large CD	
	PE	CPE	PE	CPE	PE	CPE
-10	0.04	0.04	0.52	0.52	-0.52	-0.52
-9	0.52	0.56	-0.41	0.11	-0.04	-0.56
-8	1.04	1.60	1.02	1.13	1.03	0.47
-7	-0.41	1.19	-0.25	0.88	0.30	0.77
-6	-0.60	0.59	-0.27	0.61	-0.70	0.07
-5	-1.17	-0.58	-0.20	0.41	-0.63	-0.56
-4	-0.62	-1.20	0.03	0.44	0.54	-0.02
-3	-1.51	-2.71	-0.29	0.15	0.64	0.62
-2	-1.28	-3.99	-0.86	-0.71	-0.14	0.48
-1	-1.40	-5.39	-0.38	-1.09	0.20	0.68
0	-1.27	-6.66	-1.27	-2.36	0.67	1.35
+1	-0.22	-6.88	-0.47	-2.83	0.27	1.62
+2	-0.28	-7.16	-0.34	-3.17	-0.24	1.38
+3	0.02	-7.14	-0.62	-3.79	-0.37	1.01
+4	-0.17	-7.31	1.04	-2.75	0.42	1.43
+5	-0.62	-7.93	0.46	-2.29	0.01	1.44
+6	-0.65	-8.58	-0.37	-2.66	-1.26	0.18
+7	0.05	-8.53	0.37	-2.29	1.15	1.33
+8	0.21	-8.32	0.61	-1.68	0.98	2.31
+9	-0.41	-8.73	-1.40	-3.08	-0.43	1.88
+10	-0.01	-8.74	0.42	-2.66	0.30	2.18

**B. Student's t-Statistics for Prediction Errors on -Days Around Announcement of Interest Rate Ceiling Changes**

Single Day Test			
Trading Day	1978 MMC	1973 Wild Card	1973 Large CD
-5	-2.52 <sup>b</sup>	-0.31	-0.90
-4	-1.35	0.05	0.77
-3	-3.25 <sup>c</sup>	-0.45	0.91
-2	-2.74 <sup>c</sup>	-1.33	-0.19
-1	-2.99 <sup>c</sup>	-0.59	0.28
0	-2.73 <sup>c</sup>	-1.97 <sup>a</sup>	0.95
Multiple Day Test (average daily PE over day -5 to day 0)			
	-7.39 <sup>c</sup>	-1.96 <sup>a</sup>	0.80

<sup>a</sup> Significant at .10 level (two-tailed test)

<sup>b</sup> Significant at .05 level (two-tailed test)

<sup>c</sup> Significant at .01 level (two-tailed test)

error of +0.67% on Day 0. For the week prior to announcement of MMC's, prediction errors are uniformly negative and average -1.2% per day. The cumulative prediction error over Days -5 through 0 is -7.25%. A comparable but less dramatic pattern is apparent in the week preceding introduction of the Wild Card

certificates. No apparent pattern exists in the prediction errors immediately preceding the removal of ceilings on large CD's.

Although the security price response to the announcement of a ceiling change should be concentrated on Day 0, consideration of the immediate pre-announcement price behavior seems appropriate for two (related) reasons. First, although the regulatory decision process is generally not as lengthy as legislative processes, knowledge that regulators are meeting to consider regulatory changes may be available to investors prior to the actual announced change. If this is the case, and to the extent that investors can correctly forecast the nature of the impending change, then anticipation of the announcement may generate abnormal security returns in the pre-announcement period. Some support for this conjecture exists for the MMC announcement in that the Interagency Co-ordinating Committee, which authorized the MMC, first met five trading days prior to the announcement to discuss introduction of this instrument.<sup>30</sup> A second reason for examining the returns behavior prior to announcement is that Waud [22] finds a similar pattern of abnormal returns on the days immediately preceding the announcements of discount rate changes by Federal Reserve Banks, which suggests that perhaps investors anticipate forthcoming announcements by financial market regulatory agencies.

Two statistical test procedures are employed to determine whether the prediction errors surrounding the announcements are significantly different from zero. First, single day prediction errors are tested using the following test statistic:

$$t = PE_{pT} / s_{fT} \quad (3)$$

where  $PE_{pT}$  = the prediction error for Day  $T$

$$s_{fT} = \left[ s^2 \left[ 1 + \frac{1}{n} + ((R_{MT} - \bar{R}_M)^2 / \sum_{t=1}^n (R_{Mt} - \bar{R}_M)^2) \right] \right]^{1/2}$$

with

$s^2$  = the variance of the estimation period market model regression residuals

$n$  = the number of days in the estimation period

This procedure standardizes the prediction error for Day  $T$  by the square root of the Day  $T$  forecast variance. Assuming that the market model residuals are independent and identically normally distributed, this test statistic is Student's  $t$ -distributed with 118 degrees of freedom.<sup>31</sup>

<sup>30</sup> The Interagency Co-ordinating Committee consisted of representatives of the Federal Reserve, Federal Deposit Insurance Corporation, and Federal Home Loan Bank Board. Information regarding discussions concerning the MMC's prior to announcement was obtained from William Longbrake, Deputy Comptroller of the Currency for Economic Programs, who participated in the discussions.

<sup>31</sup> Durbin-Watson statistics for the prediction errors are 1.67, 1.75, and 1.60 for the MMC, Wild Card, and CD events, respectively. Based upon these statistics, we fail to reject at the .05 level of significance the null hypothesis of no positive first-order serial correlation in the market model residuals for the MMC and Wild Card events. For the CD event, we reject the null hypothesis. The probable existence of positive first-order serial correlation in the residuals surrounding the CD event suggests that the variance of the residuals for this event is a downward-biased estimate of the variance on the market model disturbance terms. But even if this bias exists, we do not find any significant impact for the CD event.

## Deposit Rate Ceilings

1269

A second approach is to test whether the average daily prediction error in the immediate pre-announcement period is significantly different from zero. While selection of this period is admittedly arbitrary, the period from Day -5 through Day 0 is chosen because the events preceding the MMC announcement suggest that this is an appropriate time period, at least for that particular event. The statistic utilized for this test of significance is given by

$$t = \overline{PE} / \hat{\sigma}_{PI} \quad (4)$$

where

$$\overline{PE} = \frac{1}{6} \sum_{T=-5}^0 PE_{PT}$$

$$\hat{\sigma}_{PI} = \frac{1}{\sqrt{6}} \left[ \frac{1}{19} \sum_{\substack{t=-15 \\ t \notin I}}^{+10} (PE_{pt} - APE)^2 \right]^{1/2}$$

with

$$APE = \frac{1}{20} \sum_{\substack{t=-15 \\ t \notin I}}^{+10} PE_{pt}$$

$I$  = the impact period, consisting of the set of trading days  $\{-5, -4, -3, -2, -1, 0\}$

Assuming that the prediction errors are independent and identically normally distributed, this statistic has a Student's  $t$ -distribution with 19 degrees of freedom.<sup>32</sup>

Table II, Part B reports  $t$ -statistics for Day -5 through Day 0 prediction errors and for the average prediction error over this time period for each of the three regulatory announcements. For the MMC announcement, the Day -5 prediction error is significantly negative at the .05 level (two-tailed test), and the prediction errors for each of the days from -3 through 0 are significantly negative at the .01 level (two-tailed test). The prediction error for Day -4 is not significantly different from zero at the .10 level. The average prediction error over this six-day period is significantly negative at the .01 level. Based upon either test procedure we reject the null hypothesis that S & L's earned no abnormal returns around the MMC announcement. For the Wild Card announcement, the Day 0 prediction error is statistically different from zero at the .10 significance level (two-tailed test), but not at the .05 level. The average daily prediction error over Days -5 through 0 is also different from zero at the .10 significance level but not at the .05 level. Daily prediction errors for Days -5 through -1 individually are not significant at the .10 level. For the CD announcement, none of the prediction errors are different from zero at the .10 level of significance.

While the prediction errors around announcement of the Wild Card certificates are negative, the impact of introducing Wild Cards appears to have had a

<sup>32</sup> Our analysis period has been chosen so as to estimate the portfolio standard deviation based upon 10 days prior to Day -5 and 10 days after Day 0.

substantially less important effect on the common stock price performance of S & L's than did the MMC. This result is somewhat surprising since ceilings were completely eliminated on Wild Card accounts whereas in the case of MMC's variable rate ceilings were maintained.<sup>33</sup> One possible explanation for the lack of a large impact at the announced introduction of Wild Cards may be the postannouncement uncertainty regarding the regulations governing the use of Wild Card certificates. Final rules specifying permissible levels of Wild Card issues for all depository institutions were not issued until three weeks after the announcement removing the ceilings.<sup>34</sup> Because of the uncertainty regarding regulations governing Wild Cards, it is of interest to examine the portfolio prediction errors around the date that final rules governing Wild Cards were issued. Table III extends the results presented in Table II to encompass the period 15 days after the Wild Card announcement date. Day +15 is the date on which the Fed, FDIC, and FHLBB issued final rules governing the use of Wild Cards. From Table III we observe that the negative abnormal stock returns around the time of the final rules announcement for Wild Card certificates were actually more pronounced than the response observed at the initial announcement date. The cumulative prediction error from Day +11 to Day +15 is -8.23%. This figure is statistically different from zero at the .01 significance level. Moreover, the daily prediction errors for Days +11, +12, and +13 are each significantly negative at the .01 level.<sup>35</sup> Extending the analysis period to include the entire announcement period for the Wild Card certificates thus yields results which are very comparable to those experienced with the MMC announcement.

## V. Interpretation of the Results

The subsidy reduction hypothesis differs substantially from the producer protection and ceiling circumvention hypotheses in the predicted effects of changes in ceilings on thrift values. The subsidy reduction hypothesis predicts a decline in value, while the producer protection or ceiling circumvention hypotheses predict an increase or no change in value. The significantly negative abnormal returns earned by S & L stockholders following the introduction of MMC's and Wild Cards are consistent with the subsidy reduction hypothesis, but the zero returns surrounding the ceiling removal for large CD's are consistent with both the producer protection and ceiling circumvention hypotheses.

<sup>33</sup> Since there were no ceilings on the Wild Card certificates, no mandated differential between S & L rates and commercial bank rates existed on these deposits.

<sup>34</sup> Thus, for the Wild Card announcement, not only did S & L's face uncertainty regarding the behavior of rivals in response to the ceiling removal, but rules governing the use of Wild Cards were not finalized at the initial announcement. During this period of limbo between the initial announcement date and the date of final rules adoption, intense lobbying for the complete rescission of the original announcement was underway. The report of the Regulation Q Task Force [21] provides a history of Wild Cards. That report indicates that the Fed, FDIC, and FHLBB issued rules restricting the use of Wild Cards to 5% of the thrift or commercial bank's deposit base on 26 July 1973.

<sup>35</sup> Since the sizable negative returns near the final rules date actually precede the date of formal announcement, the prospect that these returns are attributable to some other event cannot be ruled out. However, a careful search of the financial press surrounding this time period has failed to detect a significant event other than the proposed (and finalized) ceiling relaxation.

*Deposit Rate Ceilings*

1271

**Table III**  
**Percentage Daily Prediction Errors**  
**(PE) and Cumulative Prediction Errors**  
**(CPE) for 34 Stock S & L's for 10 days**  
**before through 15 days after the public**  
**announcement of the "Wild Cards"**

Trading Day	PE	CPE
-10	0.52	0.52
-9	-0.41	0.11
-8	1.02	1.13
-7	-0.25	0.88
-6	-0.27	0.61
-5	-0.20	0.41
-4	0.03	0.44
-3	-0.29	0.15
-2	-0.86	-0.71
-1	-0.38	-1.09
0	-1.27	-2.36
+1	-0.47	-2.83
+2	-0.34	-3.17
+3	-0.62	-3.79
+4	1.04	-2.75
+5	0.46	-2.29
+6	-0.37	-2.66
+7	0.37	-2.29
+8	0.61	-1.68
+9	-1.40	-3.08
+10	0.42	-2.66
+11	-2.95	-5.61
+12	-2.31	-7.92
+13	-2.33	-10.25
+14	-0.22	-10.47
+15	-0.42	-10.89

Since the results are not uniform for each of the three regulatory changes which we investigate, a more detailed examination of the relative importance of the three events may contribute further evidence toward resolving which of the competing hypotheses best explains regulatory behavior.<sup>36</sup> As previously discussed in Section I, the logic on which the existence and maintenance of alleged subsidies to thrift institutions is based suggests that subsidies arise principally from the ability of S & L's to price discriminate against relatively interest-inelastic sources of deposits. Assuming that large deposits are interest-elastic relative to small deposits, then removal of ceilings on large CD's are less likely to significantly affect the alleged subsidies earned by thrift institutions than ceiling relaxations

<sup>36</sup> It is, of course, possible that different regulatory changes can be consistent with different hypotheses of regulator behavior. The strong similarity between the MMC and Wild Card impacts is therefore encouraging for the prospect of finding evidence consistent with a dominant behavioral pattern.

1272

*The Journal of Finance*

Table IV  
Percentage Distribution of Interest-Bearing Liabilities of Savings and Loan Associations 1966-1980

Type of Deposit	Dec. 1966	Dec. 1969	Dec. 1973	Dec. 1974	Dec. 1978	Dec. 1980
Subject to Fixed Ceilings:						
Passbook Savings	83.1	64.1	43.5	40.1	29.3	19.1
Fixed Ceiling Time	<u>10.9</u>	<u>29.7</u>	<u>48.7</u>	<u>49.4</u>	<u>50.6</u>	<u>23.0</u>
Total	94.0	93.8	92.2	89.5	80.0	42.2
Subject to Variable Rate Ceilings:						
Money Market Certificates	—	—	—	—	8.4	30.7
Small Saver Certificates	—	—	—	—	—	<u>9.3</u>
Total	0.0	0.0	0.0	0.0	8.4	40.0
Not Subject to Ceilings						
Large Denomination Time	—	—	1.2	1.7	3.1	7.0
FHLB Advances	5.6	5.9	5.8	7.6	6.3	7.9
Other Borrowings	<u>0.4</u>	<u>0.3</u>	<u>0.8</u>	<u>1.2</u>	<u>2.2</u>	<u>2.9</u>
Total	6.0	6.2	7.8	10.5	11.6	17.8

Source: FHLBB

on MMC's and Wild Card certificates. Following this line of reasoning, the relative magnitudes of the MMC and Wild Card (small saver accounts changes) stock price impacts vis-à-vis the large CD impact are interpreted as further evidence that is consistent with the subsidy reduction hypothesis. Alternatively, the absence of significant announcement date effects at the removal of CD ceilings may be attributable to the modest offerings of CD's by S & L's at the time of the ceiling removal.<sup>37</sup>

Additional evidence consistent with the above arguments regarding the relative importance of the regulatory changes is presented in Table IV. This table provides a breakdown of deposit categories for the S & L industry at several different points in time. Two major items of interest are available from this data. First, large denomination time deposits (CD's) constituted less than 2% of S & L financing during the mid-1970s, including the two years immediately following the ceiling removal on large CD's. This suggests that ceiling removal on large CD's did not have a material effect on S & L financing, and may be one explanation for the lack of any significant stock price impact associated with this event. Second, the substantial proportion of S & L passbook and small denomination time deposits through 1978 drops dramatically by 1980, and by a fraction that is approximately equal to the increase in deposits that are subject to market-based variable rate ceilings (of which MMC's comprise the major share). This dramatic shift in the deposit structure of S & L's following the introduction of MMC's is consistent with the subsidy reduction hypothesis, and the significant negative stock price impact associated with the introduction of MMC's.

Overall, our findings are generally consistent with the subsidy reduction hy-

<sup>37</sup> That ceilings were not a major barrier to use of CD's by S & L's is shown by the fact that short-term (90 days or less) CD's were minor sources of S & L financing even though no rate ceilings existed on these deposits.

*Deposit Rate Ceilings*

1273

pothesis, and provide no support for the producer protection hypothesis. Of course, a prior condition for the subsidy reduction hypothesis to be valid is that subsidies to S & L's must have existed prior to the regulatory changes. The very existence of subsidies, it can be argued, is *prima facie* evidence that the role of interest rate regulation has been to provide "producer protection." But the distinction that we draw between the effects (actual and intended) of the imposition of regulation and the behavior of regulators subsequent to the introduction of regulation is an important one. The capture theory of regulation posits that regulatory agencies behave in ways which do not harm the interests of the firms which they regulate. An important implication of the capture theory is therefore that changes in existing regulations not be accompanied by reductions in regulated firms' values. This implication of the capture theory is precisely the issue that we address in this paper. The statistically significant and sizable negative returns to S & L stockholders which accompany two of the three regulatory changes which we examine, and the inconsequential impact of the third, are not consistent with the producer protection hypothesis (and capture theory) of regulator behavior. The evidence is consistent with the subsidy reduction hypothesis.<sup>38</sup>

There is one further potential qualification to our interpretation of the results. The negative abnormal returns to S & L stockholders at the announced introduction of money market certificates are consistent with the hypothesis that ceilings were not raised sufficiently to allow S & L's to compete with unregulated nondepository financial intermediaries. But the lobbying activity by S & L's (noted in Footnote 38) is at odds with this interpretation. Moreover, if failure to adequately relax interest rate ceilings were the reason for the negative response to introduction of MMC's, then we would expect to find a positive response to the introduction of Wild Card certificates, since no ceiling was imposed on Wild Card rates. But Tables II and III report significant negative abnormal returns surrounding the Wild Card introduction. Thus, although the "insufficiently relaxed constraint" hypothesis is a plausible one, we believe that the evidence more strongly supports the subsidy reduction hypothesis.<sup>39</sup>

## VI. Conclusion

Our analysis indicates that common stockholders of savings and loan institutions have earned statistically significantly negative returns at the announcement of removal of interest rate ceilings on Wild Card certificates and at the introduction of short-term variable-rate money market certificates. No abnormal returns were earned at the removal of ceiling rates on certificates of deposit of over \$100,000.

<sup>38</sup> S & L lobbying activity is consistent with this interpretation, as they consistently opposed ceiling relaxation throughout this time period. See, e.g., Testimony before the U. S. Senate Subcommittee on Financial Institutions, Hearings on Regulation Q (11 September 1978).

<sup>39</sup> A further point regarding the ceiling circumvention hypothesis also warrants mention. If it is costly for S & L's to alter the mix of implicit and explicit payments to depositors, then relaxation of constraints on explicit payments will impose costs on S & L's forced by competitors to increase explicit payments, and, *ceteris paribus*, these costs will be borne most heavily by the S & L's utilizing the highest proportion of implicit payments prior to the ceiling relaxation. However, we find no empirical relationship between the stock price adjustment and various proxies for the extent of implicit payments prior to the ceiling relaxation.

This evidence is consistent with the hypothesis that savings and loans have earned economic rents from the restrictions on interest rates paid to small saver accounts, and that relaxation of interest rate ceilings has reduced these rents. The absence of abnormal returns surrounding the ceiling removal on large certificates of deposit is most likely attributable to the fact that savings and loan associations have been infrequent users of this type of financing, both before and after removal of the ceiling. Collectively, the abnormal returns behavior around the three separate instances of regulatory change which we examine are strong evidence that interest rate ceilings have been administered by federal regulatory agencies in such a way as to reduce the subsidy to thrift institutions. The results of our analysis are not consistent with the hypothesis that interest rate regulators have been "captured" by the industry they are charged to regulate.

## REFERENCES

1. Stephen J. Brown and Jerold B. Warner. "Measuring Security Price Performance." *Journal of Financial Economics* 8 (September 1980), 205-58.
2. Charles P. Clotfelder and Charles Lieberman. "On the Distributional Impact of Federal Interest Rate Restrictions." *The Journal of Finance* 33 (March 1978), 199-213.
3. Elroy Dimson. "Risk Measurement When Shares Are Subject to Infrequent Trading." *Journal of Financial Economics* 7 (June 1979), 197-226.
4. Eugene F. Fama. *Foundations of Finance*. Basic Books, 1976.
5. Jeffrey F. Jaffe. "The Effect of Regulation Changes on Insider Trading." *The Bell Journal of Economics and Management Science* 5 (Spring 1974), 93-121.
6. Dwight M. Jaffee and Kenneth T. Rosen. "Mortgage Credit Availability and Residential Construction." *Brookings Papers on Economic Activity* 2 (1979), 333-76.
7. ———. "The Changing Liability Structure of Savings and Loan Associations." *AREUEA Journal* (Spring 1980), pp. 33-49.
8. Gregg A. Jarrell and Michael Bradley. "The Economic Effects of Federal and State Regulations of Cash Tender Offers." *Journal of Law and Economics* 23 (October 1980), 371-407.
9. William A. Jordan. "Producer Protection, Prior Market Structure and the Effects of Government Regulation." *Journal of Law and Economics* 15 (April 1972), 151-76.
10. Edward J. Kane. "Short-changing the Small Saver: Federal Discrimination against the Small Saver during the Vietnam War." *Journal of Money, Credit, and Banking* 2 (November 1970), 513-22.
11. ———. "Reregulation, Savings-and-Loan Diversification and the Flow of Housing Finance." Ohio State University Working Paper #81-1, January 1981.
12. Benjamin F. King. "Market and Industry Factors in Stock Price Behavior." *Journal of Business* 39 (January 1966), 139-90.
13. Sam Peltzman. "Toward a More General Theory of Regulation." *Journal of Law and Economics* 19 (August 1976), 211-40.
14. David H. Pyle. "The Losses on Savings Deposits from Interest Rate Regulation." *The Bell Journal of Economics and Management Science* 5 (Autumn 1974), 614-22.
15. Richard S. Ruback. "The Effect of Discretionary Price Control Decisions on Equity Values." *Journal of Financial Economics* (forthcoming).
16. Myron Scholes and Joseph Williams. "Estimating Betas from Nonsynchronous Data." *Journal of Financial Economics* 5 (December 1977), 309-27.
17. G. William Schwert. "Public Regulation of National Securities Exchanges: A Test of the Capture Hypothesis." *The Bell Journal of Economics* 8 (Spring 1977), 123-50.
18. ———. "Using Financial Data to Measure Effects of Regulation." University of Rochester Working Paper #GPB 78-7, July 1979.
19. George J. Stigler. "The Theory of Economic Regulation." *The Bell Journal of Economics and Management Science* 2 (Spring 1971), 3-21.

*Deposit Rate Ceilings*

1275

20. Robert A. Taggart, Jr. "Effects of Deposit Rate Ceilings: The Evidence from Massachusetts Savings Banks." *Journal of Money, Credit, and Banking* 10 (May 1978), 139-57.
21. U. S. Department of the Treasury. *Deposit Interest Rate Ceilings and Housing Credit: The Report of the President's Inter-Agency Task Force on Regulation Q*. July 1979.
22. Roger N. Waud. "Public Interpretation of Discount Rate Changes: Evidence on the 'Announcement Effect'." *Econometrica* 39 (March 1970), 231-50.

# **EXHIBIT O**

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

IN RE ADAMS GOLF, INC.  
SECURITIES LITIGATION

CONSOLIDATED  
C.A. No. 99-371 KAJ

**AFFIDAVIT OF R. ALAN MILLER IN SUPPORT OF  
PLAINTIFFS' OPPOSITION TO THE ADAMS GOLF  
DEFENDANTS' MOTION FOR SUMMARY JUDGMENT**

R. ALAN MILLER declares as follows:

1. I submit this affidavit in connection with plaintiffs' opposition to the Adams Golf defendants' motion for summary judgment.
2. With respect to the deposition testimony of Dr. James, defendants' expert, on August 11, 2006, I note particularly three positions that James asserted that were new or amplified from the positions James took in his opening and rebuttal reports. First, James allowed for the possibility that material information could "leak" into the market. That is, as I understand James's deposition testimony, it is possible for rumor, oral communication, or observation to materially affect stock prices. See James Dep. Tr., pp. 116, 121-22, 126-31 (cited pages attached hereto at Tab A). Second, James asserted (or admitted) that under some circumstances it is permissible to use event windows of two days. Tab A, pp. 221-22. Third, the industry index that I employed in the analysis contained in my rebuttal report -- the "Miller index", as James referred to it -- as well as the Standard & Poors ("S&P") Small Cap index may be considered, in James's view, in connection with running daily regression analyses in this case. Tab A, pp. 85-

94.

3. In addition, James asserted for the first time at his deposition that the decline in the price of Adams Golf stock during July 1998 was consistent with the declines in the Miller index and the S&P Small Cap index during the same period. Tab A., pp. 93-94.

4. Notwithstanding these positions that I understand James to have asserted at his deposition, James did not appear to change his position as to the dates, during and immediately after the class period, on which there occurred statistically significant stock movement. Specifically, James appears not to have changed his position, previously expressed, that during July 1998, there were no statistically significant movements in Adams Golf common stock.

5. As I expressed in my rebuttal report, I have serious reservations regarding the usability and appropriateness of event study regression analyses in a case such as this. In particular, this case involves an IPO, 1933 Act claims, and the absence of a clean "estimation" period prior to the class period.

6. Nonetheless, I have been asked to assume, *arguendo*, that event study regression analysis can be appropriate in a case such as this, and to attempt to replicate portions of James's regression analysis, substituting variables or assumptions as appropriate. Specifically, I refer to James's agreement at his deposition with a position to which I subscribe -- in appropriate cases, particularly where information reaches the market by way of "leakage"-- an event or measurement window in excess of a single day may be appropriate.

7. Accordingly, I caused there to be run a regression using as many assumptions as possible from the various daily regressions that James ran, except I lengthened the window or measurement period. My regression used or assumed a window or measurement period of 12

days after examination of the Adams Golf stock price data.. I believe that a window period of this length is appropriate in this case in view of the fact that, during the window period, the stock price was reacting to rumor, "leaked" information, or other forms of non-published disclosure. In such a situation, it is difficult to ascertain exactly when new material information enters the market. Indeed, it appears that in this case the information entered the market gradually, over a period of time, as increasing numbers of market participants gained access to the information. This exercise allowed testing of plaintiffs' assertion that the Adams Golf stock price moved in a significant fashion in July 1998 as a result of "leakage" that gray marketing was seriously affecting Adams Golf.

8. The results of this regression are set forth on Tab B to this Affidavit. We analyzed the movement of Adams Golf returns versus, or adjusted for, the returns to the NASDAQ index (used by James) for each of the 12 consecutive day periods in the Class Period and discovered that there was only a 3% chance of any other 12-day period having as significant a deviation of Adams Golf returns from NASDAQ returns as the first 12 days' returns<sup>a</sup> meaning that the price movements in that period contrasted with NASDAQ were statistically significant. To further test the difference between Adams Golf returns in the first 12 days and the remaining days of the Class Period—adjusted for the NASDAQ returns in the same periods—we did the following. We created a slope (trend) line analysis, first, to compare the trend in Adams Golf's price in the period July 10 through July 28, 1998 to its trend in the remaining days from July 29 on; and, second, to take into account the changes in NASDAQ returns over these same two

---

<sup>a</sup> There are 12 days of returns for the 12 trading days of July 13, 1998 through July 28, 1998. To calculate these returns requires prices for the 13 trading days from July 10, 1998 through July 28, 1998.

periods. I then compared the difference between the first 12 day period movement in Adams stock price and the rest of the Class Period to the difference between the first 12-day period movement in the NASDAQ index and its movement in the rest of the Class Period<sup>b</sup> and noted two results. First, the slope of Adams Golf prices over the first period (July 10 – 28, 1998) is strongly significantly different from the same slope in the remainder of the Class Period from July 29 on. Second, the difference between the differences of the Adams Golf slopes and the NASDAQ slopes over the two periods is strongly and statistically significantly different, showing that the movement in the NASDAQ index does not explain the movement in Adams Golf during July 1998. The above results confirm that Adams Golf stock moved in a statistically significant manner during the period July 10, 1998 - July 28, 1998.

Pursuant to 28 U.S.C. 1746, I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. Executed on October 6, 2006.



R. ALAN MILLER

adamsaffcollins.wpd

<sup>b</sup> A downward slope (trend) in prices over a period implies negative returns over the period. In general, the slope of price on day (time) is one way to measure average returns over any period.

## **Statistical Significance of the Drop in Adams Golf Returns July 13-July 28, 1998<sup>1</sup>**

It is useful to assess in two different ways the statistical significance of the drop in Adams Golf returns in the first 12-day period of the class period, i.e. is the drop significantly different from "chance."

1. The first way is a largely "non-parametric" approach, which determines how unusual that 12-day drop ("net of" the NASDAQ drop over the same period) is compared to all other 12-day periods during the 75 days (there are about 62 such periods). The steps are:

- To get the Adams Golf returns net of, i.e. adjusted for, NASDAQ returns, the Adams Golf returns are regressed on the NASDAQ returns (see Addendum, page 3 below for the printout).
- Find the residuals in date order from this regression. These are James' residuals which he uses to judge statistical significance.
- Each residual is an Adams Golf return net of, i.e. adjusted for, NASDAQ returns.
- Sum the first 12 days of the residuals, and then continue to find the sums of residuals for all moving 12-day periods after that formed by advancing one day at a time.
- Find the observed cumulative distribution of these summed residuals (Figure 1).
- Find the percent of summed residuals that are less than or equal to the first 12-day period's summed residuals.
- The results are:

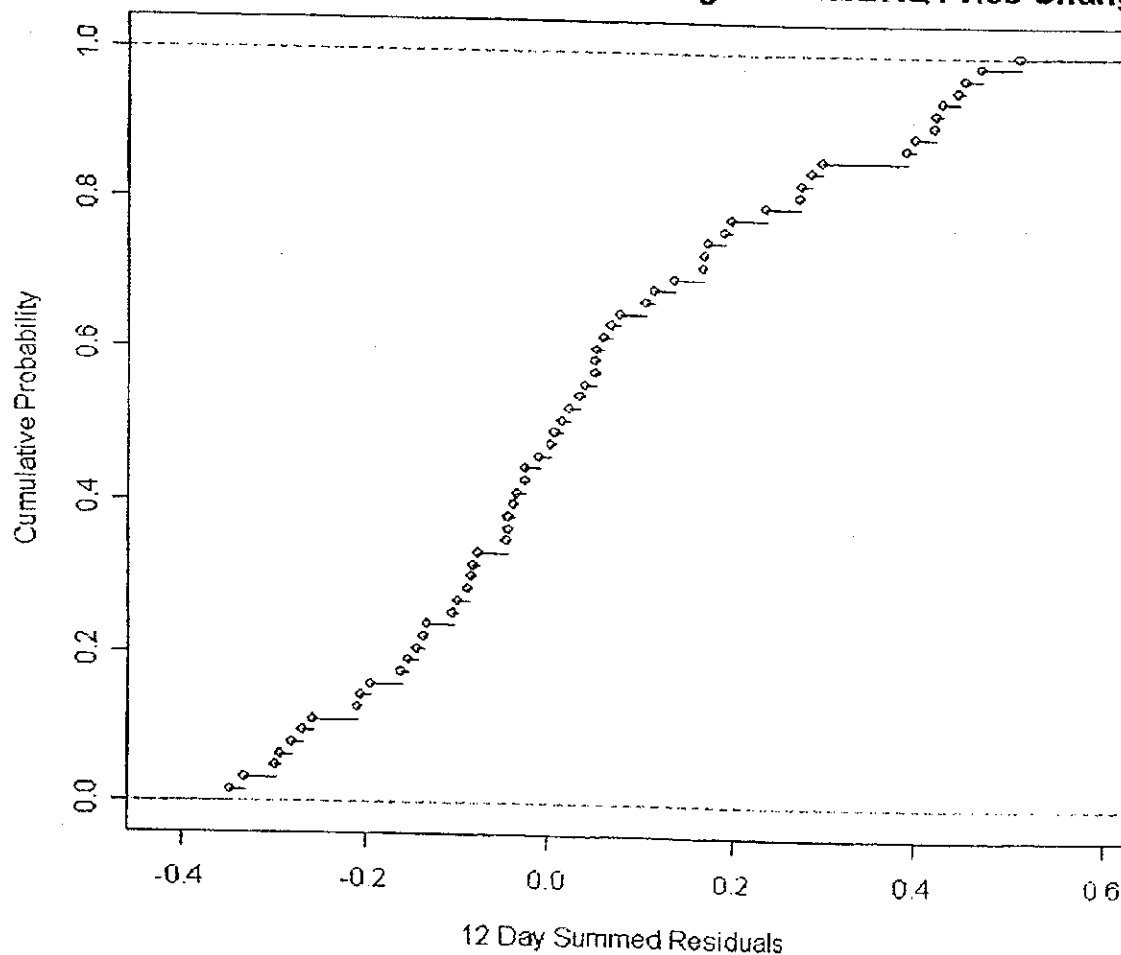
The sum of residuals from the returns of July 13 through July 28, 1998 is -0.34864. The frequency (probability) of 12-day summed residuals less than or equal to -34.86% is about 3%. Since 3% is less than 5%, the first 12 days' summed residuals are statistically significant at the 5% level in terms of a non-parametric "randomization" or "permutation" test as applied to a time series.

---

<sup>1</sup> See the last page of the Addendum below for explanation of the "return" on a day. There are 12 days of returns for the 12 trading days of July 13, 1998 through July 28, 1998. To calculate these returns requires prices for the 13 trading days from July 10, 1998 through July 28, 1998.

**Figure 1**

**Empirical Cumulative Distribution of 12 Day Summed Residuals:  
Regression of Adams Golf Price Change on NASDAQ Price Change**



2. A second way to determine if the first 12 day's returns are statistically significantly different from "chance" is to fit a "piecewise linear" model to the Adams Golf prices (not returns), and likewise to the NASDAQ prices (not returns). That is, fit lines with different slopes to the first 13 days of prices (first 12 days of returns) and the remaining 62 days of prices for Adams Golf. Repeat this for NASDAQ. The slopes of the

two lines in the Adams Golf regression are strongly statistically different from each other, and quite different in magnitude as well, establishing the existence of importantly different slopes. Further, by comparing this result to analogous regressions for the NASDAQ Index it is established that the difference in the two Adams Golf slopes between the first 13 days and the remaining days is not explained by the change in NASDAQ over these same two periods.

## Addendum

### Regression of daily Adams Golf returns on NASDAQ returns to adjust Adams for the market

The regression done by James is of the Adams Golf fractional price changes on the NASDAQ fractional price changes. This yields the following results (shown in R 2.3.1):

```
> summary(golf.fit.1)

Call:
lm(formula = PIBC$adgo ~ PIBC$nasdaq)

Residuals:
    Min       1Q   Median       3Q      Max
-0.1392300 -0.0466335  0.0009123  0.0354224  0.1839972

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) -0.016495   0.007509  -2.197  0.031264 *
PIBC$nasdaq  1.200588   0.302063   3.975  0.000166 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.06447 on 72 degrees of freedom
Multiple R-Squared:  0.1799,    Adjusted R-squared:  0.1685
F-statistic: 15.8 on 1 and 72 DF,  p-value: 0.0001657
```

The coefficient 1.200588 is significant, and is interpreted as an average 1.2 percent increase in the Adams Golf fractional price change for every 1.0 percent increase in the NASDAQ fractional price change. However, R-Squared is about 18%, which means that 82% of the variation in Adams Golf fractional price change is not explained by the NASDAQ changes.

Summary statistics for the residuals of this model are:

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
-1.392e-01	-4.663e-02	9.150e-04	8.974e-20	3.542e-02	1.840e-01

The residual standard error is 0.06447, and the residual mean is 0. Consequently, it is expected that 95% of the residuals will lie in the interval (-0.1264, 0.1264), and 90%

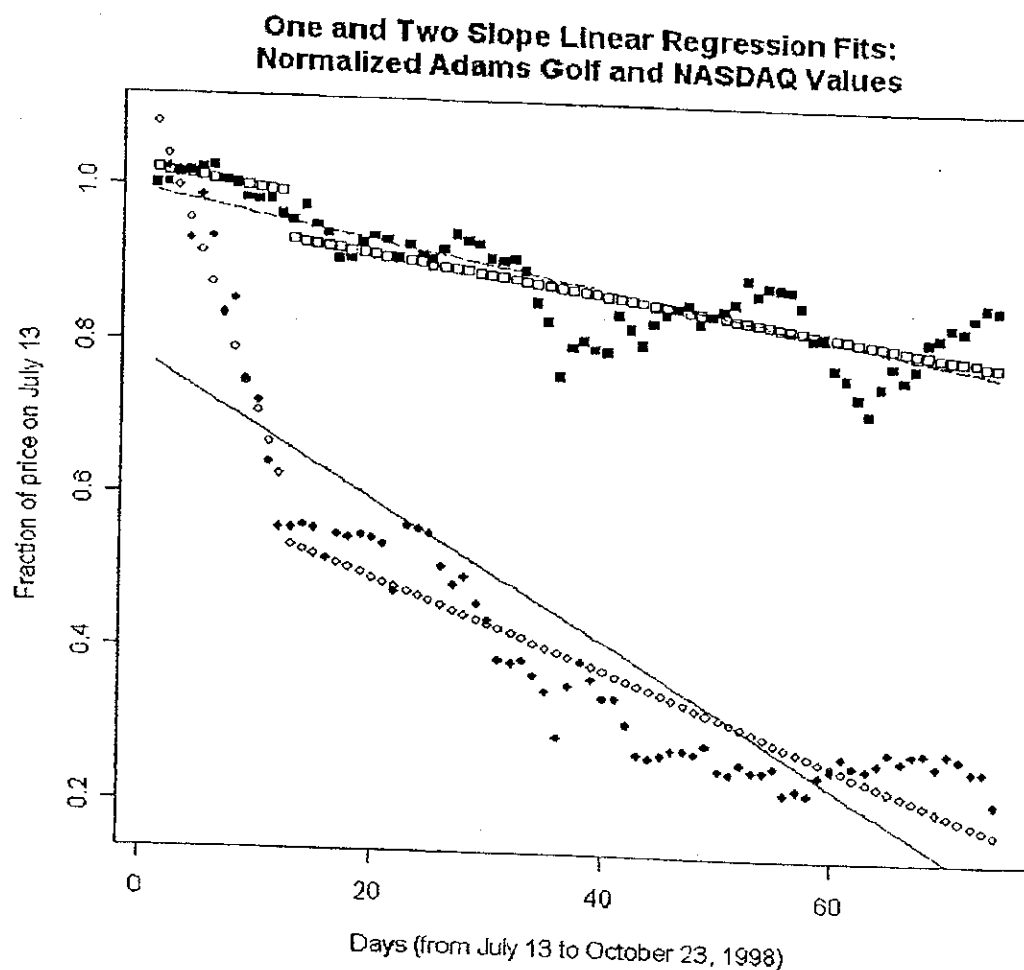
in the interval  $(-0.1061, 0.1061)$ . The residuals outside the 95% interval are what James terms "statistically significant", and occur on the dates August 12, September 1, and October 23. These same dates and August 4, September 21, September 29, and October 2 are outside the 90% interval.

### **One and Two-slope models for Adams Golf price and for the NASDAQ Index**

One and two-slope linear regression models were fitted to (1) explain Adams Golf price as a function of "time" (day) in the 75 day class period; and, then, (2) to the NASDAQ Index as a function of "time" (day) in the same period. In the two-slope models the best least squares fit to the data allowed the slope and the intercept of the fitted lines to change between the first 12 days and the remaining 62 days. The change-point of July 28 was chosen to reflect the sharp drop in the Adams Golf stock price which occurred from the first to the twelfth day, and nowhere else in the data. For convenience of comparison, the prices of both stocks were normalized to their price on July 13, 1998.

The following graph illustrates the different fits. Following the graph are printouts from the regressions, and commentary.

**Figure 2**



Here the filled diamonds are the normalized price data fro Adams Golf. The corresponding one and two-slope fits are indicated by the solid line and open diamonds, respectively. The filled squares are the normalized price data for the NASDAQ Index. Their corresponding one and two-slope fits are indicated by the dashed line and the open squares.

**Printouts from the regressions for Adams Golf (one slope and two slope), for the NASDAQ Index, and commentaries:**

### **ADAMS GOLF REGRESSIONS**

**Single slope model for Adams Golf price over time:**

```
> summary(golf.fit.6)
```

```

Call:
lm(formula = PIBC$adgo.price.norm ~ PIBC$time)

Residuals:
    Min       1Q   Median       3Q      Max
-0.16009 -0.07425 -0.04307  0.06635  0.26668

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.7781500   0.0249293   31.21  <2e-16 ***
PIBC$time    -0.0091061   0.0005776  -15.76  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1061 on 72 degrees of freedom
Multiple R-Squared: 0.7754,    Adjusted R-squared: 0.7722
F-statistic: 248.5 on 1 and 72 DF,  p-value: < 2.2e-16

```

### Two-slope model for Adams Golf price over time:

```

> summary(golf.fit.7)

Call:
lm(formula = PIBC$adgo.price.norm ~ PIBC$time * PIBC$drop12)

Residuals:
    Min       1Q   Median       3Q      Max
-0.1098721 -0.0423178 -0.0001569  0.0481051  0.0888530

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.6115428   0.0177202   34.511  < 2e-16 ***
PIBC$time    -0.0058731   0.0003767  -15.590  < 2e-16 ***
PIBC$drop12   0.5102016   0.0371673   13.727  < 2e-16 ***
PIBC$time:PIBC$drop12 -0.0354474   0.0044551   -7.957 2.20e-11 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.05308 on 70 degrees of freedom
Multiple R-Squared: 0.9454,    Adjusted R-squared: 0.943
F-statistic: 403.8 on 3 and 70 DF,  p-value: < 2.2e-16

```

There is a substantial difference between these two models. The single slope model has an R-Squared of 0.7754, the two-slope model an R-Squared of 0.9454. Fitting two-slopes accounts for the linear variation in all but about 5% of the data, compared to over 22% unaccounted for by the single slope model. The effective change in slope is from about a 4% average decrease per day in normalized price before day 13, to about 0.6% average decrease per day from day 13 on.

Furthermore, the difference between the two models is statistically significant. This can be found by analyzing the change in least squares between the two models, using the F distribution. A summary of this test follows:

```
> anova(golf.fit.7,golf.fit.6)
Analysis of Variance Table

Model 1: PIBC$adgo.price.norm ~ PIBC$time * PIBC$drop12
Model 2: PIBC$adgo.price.norm ~ PIBC$time
  Res.Df    RSS Df Sum of Sq    F    Pr(>F)
1      70 0.19726
2      72 0.81113 -2   -0.61388 108.92 < 2.2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

The above results demonstrate that the two-slope model provides a statistically significantly better fit than the one-slope model, and provides a substantially more accurate model of the price behavior. In other words, the apparent change in the rate of decline of Adams Golf stock price is statistically significant.

## NASDAQ REGRESSIONS

A quite different picture is found for the NASDAQ index. While the two-slope NASDAQ model is barely statistically significantly better than the on-slope NASDAQ model, it adds little to the explanation, and the difference in the slope between the 12 days of returns (July 13-28, 1998) and after is minimal, and not statistically significant. Consistent with these observations, we can say that neither the decrease in NASDAQ over time, nor the difference in that decrease between July 13-28 and after, provides an explanation for the decrease in Adams Golf returns over the whole period, or for the change in the rate of decrease in Adams Golf returns between July 13-28 and after.

### Single slope model for the NASDAQ Index over time:

```
> summary(golf.fit.8)

Call:
lm(formula = PIBC$nasdaq.price.norm ~ PIBC$time)

Residuals:
    Min       1Q   Median       3Q      Max
-0.125251 -0.025523  0.003834  0.028441  0.087319

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.9941651   0.0099199   100.22 <2e-16 ***
PIBC$time    -0.0029484   0.0002299   -12.83 <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Residual standard error: 0.04224 on 72 degrees of freedom  
 Multiple R-Squared: 0.6956, Adjusted R-squared: 0.6914  
 F-statistic: 164.5 on 1 and 72 DF, p-value: < 2.2e-16

### Two-slope model for the NASDAQ Index over time:

```
> summary(golf.fit.9)
```

Call:

```
lm(formula = PIBC$nasdaq.price.norm ~ PIBC$time * PIBC$drop12)
```

Residuals:

Min	1Q	Median	3Q	Max
-0.116025	-0.020883	0.007067	0.023563	0.075328

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	0.9642951	0.0133869	72.033	< 2e-16 ***
PIBC\$time	-0.0023750	0.0002846	-8.345	4.23e-12 ***
PIBC\$drop12	0.0592683	0.0280784	2.111	0.0384 *
PIBC\$time:PIBC\$drop12	-0.0011811	0.0033656	-0.351	0.7267

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.0401 on 70 degrees of freedom  
 Multiple R-Squared: 0.7332, Adjusted R-squared: 0.7218  
 F-statistic: 64.12 on 3 and 70 DF, p-value: < 2.2e-16

The lack of significance of the fourth coefficient ("PIBC\$time:PIBC\$drop12") in the regression summary indicates that there is no statistically significant change in slope for the NASDAQ Index between July10-28 and after. For this reason, we can say that the change in rate of decline in NASDAQ price between July10-28 and after cannot account for the (dramatic) change in the rate of decline of Adams Golf returns between July 13-28 and after, which is statistically significant.

At the same time the difference between the two NASDAQ models—the one-slope and the two-slope models—is statistically significant:

```
> anova(golf.fit.9,golf.fit.8)
Analysis of Variance Table
```

Model 1: PIBC\$nasdaq.price.norm ~ PIBC\$time \* PIBC\$drop12

Model 2: PIBC\$nasdaq.price.norm ~ PIBC\$time

	Res.Df	RSS	Df	Sum of Sq	F	Pr(>F)
1	70	0.112578				
2	72	0.128436	-2	-0.015857	4.93	0.00993 **

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

However, here, for NASDAQ prices, while the two-slope model provides a better fit, the change is small; R-Squared increases from 0.6956 to 0.7332, so that only 3% more of the

variation in NASDAQ price is accounted for by the two-slope model. Furthermore, not all regression coefficients in the two-slope model are significant. The price behavior of the NASDAQ Index normalized price has a constant average decrease of about 0.25% per day from July 13 to October 23.

#### EXPLANATION OF "RETURN" FOR A GIVEN DATE (DAY)

- The return for Adams listed on the row at day 1 (see excerpt below from spreadsheet of data) is defined as the Adams price on day 2 less its price on day 1 all divided by its price on day 1. Similarly for the indexes.
- It may be easier to read this to have put the above return given in the row for day 1 on the row for day 2, because it is really the return over day 2 or to day 2.
- However, given the way the returns are listed, there are 12 Adams returns calculated using data from day 1 through day 13 (giving 12 returns) that include the last big drop of -0.131 on day 12. So there are exactly 12 returns at the beginning that are sharply downward trending, notwithstanding the two positive returns occurring on days 2 and 8, which should be noted.
- The 12 returns are accurately described as the returns of the market on the 12 days of 07-13-98 ("day 2" below) through 07-28-98 ("day 13" below).

day	date	adams	adamscr	nasdaq	nasdaqcr	bloomberg	bloombergcr	day
1	07-10-98	18.375	-0.027	1943.04	0.012	110.45	-0.009	1
2	07-13-98	17.875	0.021	1965.53	0.001	109.45	0.005	2
3	07-14-98	18.25	-0.003	1968.41	0.013	110.05	-0.009	3
4	07-15-98	18.188	-0.086	1994.54	0.003	109.11	-0.018	4
5	07-16-98	16.625	0.060	2000.56	0.004	107.16	0.003	5
6	07-17-98	17.625	-0.053	2008.76	0.003	107.48	-0.008	6
7	07-20-98	16.688	-0.105	2014.25	-0.017	106.60	-0.023	7
8	07-21-98	14.938	0.021	1979.14	-0.005	104.19	-0.002	8
9	07-22-98	15.25	-0.127	1969.75	-0.018	103.96	-0.049	9
10	07-23-98	13.313	-0.033	1935.22	-0.002	98.83	-0.002	10
11	07-24-98	12.875	-0.112	1930.99	0.001	98.62	-0.020	11
12	07-27-98	11.438	-0.131	1933.26	-0.019	96.66	-0.019	12
13	07-28-98	9.938	0.000	1896.53	-0.008	94.87	-0.014	13

14	07-29-98	9.938	0.009	1881.49	0.020	93.54	0.000	14
15	07-30-98	10.031	-0.009	1919.62	-0.025	93.55	-0.016	15

# **EXHIBIT P**

Westlaw

FILING 98580302

Page 1

Company Record

S.E.C. Filing

CALLAWAY GOLF CO

10-K

December 31, 1997

Filed: March 31, 1998

TABLE OF CONTENTS

BUSINESS.....	WESTLAW Page 8
PROPERTIES.....	WESTLAW Page 50
LEGAL PROCEEDINGS.....	WESTLAW Page 52
SUBMISSION TO A VOTE.....	WESTLAW Page 54
MARKET FOR EQUITY.....	WESTLAW Page 63
SELECTED FINANCIAL DATA.....	WESTLAW Page 63
MANAGEMENT DISCUSSION.....	WESTLAW Page 63
FINANCIAL STATEMENTS SUPP INFO.....	WESTLAW Page 64
CHANGES IN ACCOUNTING.....	WESTLAW Page 64
DIRECTORS AND OFFICERS.....	WESTLAW Page 65
EXECUTIVE COMPENSATION.....	WESTLAW Page 66
EXHIBITS AND REPORTS.....	WESTLAW Page 68
MATERIAL CONTRACTS.....	WESTLAW Page 100
MATERIAL CONTRACTS.....	WESTLAW Page 178
ARS 10-Q QUARTERLY REPORT.....	WESTLAW Page 182
SELECTED FINANCIAL DATA.....	WESTLAW Page 185
MANAGEMENT DISCUSSION.....	WESTLAW Page 189
BALANCE SHEET.....	WESTLAW Page 215
INCOME STATEMENT.....	WESTLAW Page 218
CASH FLOW STATEMENT.....	WESTLAW Page 221
SHAREHOLDERS EQUITY.....	WESTLAW Page 225
AUDIT REPORT.....	WESTLAW Page 275
SUBSIDIARIES.....	WESTLAW Page 281
CONSENTS EXPERTS COUNCEL.....	WESTLAW Page 283
FINANCIAL DATA SCHEDULE.....	WESTLAW Page 284
OTHER EXPENSES.....	WESTLAW Page 286
FINANCIAL DATA SCHEDULE.....	WESTLAW Page 287
OTHER EXPENSES.....	WESTLAW Page 289
FINANCIAL DATA SCHEDULE.....	WESTLAW Page 289
OTHER EXPENSES.....	WESTLAW Page 291
FINANCIAL DATA SCHEDULE.....	WESTLAW Page 292
OTHER EXPENSES.....	WESTLAW Page 294
FINANCIAL DATA SCHEDULE.....	WESTLAW Page 295
OTHER EXPENSES.....	WESTLAW Page 297

wholly-owned subsidiary of the Company, for the purpose of designing, manufacturing and selling golf balls. The Company has previously licensed the manufacture and distribution of a golf ball product in Japan and Korea. The Company also distributed a golf ball under the trademark 'Bobby Jones.' These golf ball ventures were not commercially successful.

The Company has determined that Callaway Golf Ball Company will enter the golf ball business by developing a new product in a new plant to be constructed just for this purpose. The successful implementation of the Company's strategy could be adversely affected by various risks, including, among others, delays in product development, construction delays and unanticipated costs. There can be no assurance if and when a successful golf ball product will be developed or that the Company's investments will ultimately be realized.

The Company's golf ball business is in the early stages of development. It is expected, however, that it will have a negative impact on the Company's future cash flows and results of operations for several years. The Company believes that many of the same factors which affect the golf equipment industry, including growth rate in the golf equipment industry, intellectual property rights of others, seasonality and new product introductions, also apply to the golf ball business. In addition, the golf ball business is highly competitive with a number of well-established and well-financed competitors. These competitors have established market share in the golf ball business which will need to be penetrated in order for the Company's golf ball business to be successful.

#### Sales and Marketing

##### Sales for Distribution in the United States

Approximately 65%, 68% and 66% of the Company's net sales were derived from sales for distribution within the United States in 1997, 1996 and 1995, respectively. The Company targets those golf retailers (both on-course and off- course) who sell 'pro-line' clubs (professional quality golf clubs) and provide a level of customer service appropriate for the sale of premium golf clubs. No one customer that distributes golf clubs in the United States accounted for more than 5% of the Company's revenues in 1997, 1996, and 1995. The Company distributes its products in Hawaii through an exclusive distributor.

The Company, through its subsidiaries Callaway Golf Sales Company and Odyssey, currently employ full-time regional field representatives, in-house telephone salespersons and customer service representatives in connection with golf club and accessory sales. Each geographic region is covered by both a field representative and a telephone salesperson

who work together to initiate and maintain relationships with customers through frequent telephone calls and in-person visits. The Company believes that this tandem approach of utilizing field representatives and telephone salespersons provides the Company a competitive advantage over other golf club manufacturers that distribute their golf clubs solely through independent sales representatives rather than employees. Notwithstanding the foregoing, Callaway Golf recognizes that other companies have marketing programs which may be equally or more effective than its own strategy.

Some quantities of the Company's products find their way to unapproved outlets or distribution channels. This 'gray market' in the Company's products can undermine authorized retailers and distributors who promote and support the Company's products, and can injure the Company's image in the minds of its customers and consumers. On the other hand, stopping such commerce could result in a potential decrease in sales to those customers who are selling Callaway Golf products to unauthorized distributors and/or an increase in sales returns over historical levels. While the Company has taken some lawful steps to limit commerce in its products in the 'gray market' in both domestic and international markets, it has not stopped such commerce. The Company's efforts to address gray market issues could have an adverse impact on the Company's sales and financial performance.

6

#### Sales for Distribution Outside of the United States

Approximately 35%, 32% and 34% of the Company's net sales were derived from sales for distribution outside of the United States in 1997, 1996 and 1995, respectively. The majority of the Company's international sales are made through distributors specializing in the sale and promotion of golf clubs in specific countries or regions around the world. The Company currently has distribution arrangements covering sales of the Company's products in over 40 foreign countries, including Japan, Canada, Singapore, Spain, Italy, France, Hong Kong, Australia, Argentina and South Africa. Prices of golf clubs for sales outside of the United States receive an export pricing discount to compensate international distributors for selling, advertising and distribution costs. A change in the Company's relationship with significant distributors could negatively impact the volume of the Company's international sales.

The Company directly markets its products in the United Kingdom, Belgium, Finland, Denmark and Sweden through its wholly-owned British subsidiary, Callaway Golf Europe Ltd. (formerly Callaway Golf (UK) Limited). In 1996, the Company acquired a majority interest in its distributor in Germany, Golf Trading GmbH, which sells and promotes the Company's products in Germany, Austria, the Netherlands and

Company itself, sought to obtain patent, trademark or other protection of their proprietary rights and designs. From time to time others have or may contact the Company to claim that they have proprietary rights which have been infringed by the Company and/or its products. The Company evaluates any such claims and, where appropriate, has obtained or sought to obtain licenses or other business arrangements. To date, there have been no interruptions in the Company's business as the result of any claims of infringement. No assurance can be given, however, that the Company will not be adversely affected in the future by the assertion of intellectual property rights belonging to others. This effect could include alteration of existing products, withdrawal of existing products and delayed introduction of new products.

Various patents have been issued to the Company's competitors in the golf ball industry. As Callaway Golf Ball Company develops a new golf ball product, it must avoid infringing on these patents or other intellectual property

31

rights, or it must obtain licenses to use them lawfully. If any new golf ball product was found to infringe on protected technology, the Company could incur substantial costs to redesign its golf ball product or to defend legal actions. Despite its efforts to avoid such infringements, there can be no assurance that Callaway Golf Ball Company will not infringe on the patents or other intellectual property rights of third parties in its development efforts, or that it will be able to obtain licenses to use any such rights, if necessary.

#### 'Gray Market' Distribution

Some quantities of the Company's products find their way to unapproved outlets or distribution channels. This 'gray market' in the Company's products can undermine authorized retailers and distributors who promote and support the Company's products, and can injure the Company's image in the minds of its customers and consumers. On the other hand, stopping such commerce could result in a potential decrease in sales to those customers who are selling Callaway Golf products to unauthorized distributors and/or an increase in sales returns over historical levels. While the Company has taken some lawful steps to limit commerce in its products in the 'gray market' in both domestic and international markets, it has not stopped such commerce. The Company's efforts to address gray market issues could have an adverse impact on the Company's sales and financial performance.

#### Professional Endorsements

The Company also establishes relationships with professional golfers in order to promote the Callaway Golf brand among both professional and

# **EXHIBIT Q**

Westlaw

FILING 99588479

Page 1

Company Record

S.E.C. Filing

ADAMS GOLF INC

DEF 14A

Proxy

May 05, 1999

Filed: April 07, 1999

TABLE OF CONTENTS

NOTICE OF MEETING.....	WESTLAW Page 7
VOTING ISSUES.....	WESTLAW Page 8
ELECTION OF DIRECTORS.....	WESTLAW Page 19
BOARD COMMITTEES.....	WESTLAW Page 26
PRINCIPAL SHAREHOLDERS.....	WESTLAW Page 29
BENEFICIAL OWNERSHIP.....	WESTLAW Page 29
MANAGEMENT OWNERSHIP.....	WESTLAW Page 29
OFFICERS.....	WESTLAW Page 36
EXECUTIVE COMPENSATION.....	WESTLAW Page 39
OPTIONS.....	WESTLAW Page 42
ACCOUNTANTS.....	WESTLAW Page 71

SCHEDULE 14A INFORMATION

PROXY STATEMENT PURSUANT TO SECTION 14(A)

OF THE SECURITIES EXCHANGE ACT OF

1934

, AS AMENDED (AMENDMENT NO. \_\_)

Filed by the Registrant XOE

Filed by a Party other than the Registrant OE

Check the appropriate box:

OE Preliminary Proxy Statement

OE Confidential, for Use of the Commission Only (as permitted  
by Rule 14a-6(e)(2))

XOE Definitive Proxy Statement

OE Definitive Additional Materials

OE Soliciting Material Pursuant to 240.14a-11(c) or  
240.14a-12

ADAMS GOLF, INC.

The following performance graph compares the performance of the Adams Golf common stock to the Standard & Poor's Small Cap 600 index and an industry peer group, selected in good faith, for the period from July 10, 1998, the first day of trading for the Company's shares, through December 31, 1998. The graph assumes that the value of the investment in the Company's common stock and each index was \$100.00 at July 10, 1998, and that all dividends were reinvested. The Company has paid no dividends. Performance data is provided for the last trading day closest to month end for each month in 1998.

#### Comparison of Cumulative Total Returns

Performance Graph for period from  
July 10, 1998 through December 1998OE

July 10, Company	July 1998	Aug. 1998	Sept. 1998	Oct. 1998	Nov. 1998	Dec. 1998	1998	1998
Adams Golf, Inc.	100	62	32	26	29	25	26	
Peer Group (1)	100	63	52	54	55	66	52	
S&P Small Cap 600	100	96	78	82	86	91	97	

- (1) Peer Group consists of: Callaway Golf Company, TearDrop Golf Company, Aldila, Inc. and Coastcast Corp.

-15-

#### ITEM 2.

#### APPROVAL OF 1999 NON-EMPLOYEE DIRECTOR PLAN

#### General

On February 3, 1999, the Board of Directors adopted, subject to stockholder approval, the 1999 Non-Employee Director Plan of Adams Golf, Inc. (the 'Director Plan'), the text of which is attached as Annex A to this Proxy Statement. Unless the Director Plan is approved by the stockholders on or before January 1, 2000, it and all awards granted pursuant to the Director Plan will, under the terms of the plan, be null and void. The material features of the Director Plan are discussed below, but the description is subject to and is qualified in its entirety by the full text of the Director Plan.

The purpose of the Director Plan is to advance the

# **EXHIBIT R**

# Graham and Dodd's **Security Analysis**

**Fifth Edition**

**Sidney Cottle**

President, FRS Associates  
Coauthor of *Security Analysis*, Fourth Edition

**Roger F. Murray**

S. Sloan Colt Professor Emeritus of Banking  
and Finance  
Columbia University Graduate School of Business

**Frank E. Block**

Member of Financial Accounting Standards Board,  
1979–1985 (retired)  
Past President of FAF and ICFA

*With the collaboration of*

**Martin L. Leibowitz**

Managing Director, Bond Portfolio Analysis Group  
Salomon Brothers, Inc.

**McGraw-Hill Book Company**

New York St. Louis San Francisco Auckland  
Bogotá Hamburg London Madrid Mexico  
Milan Montreal New Delhi Panama  
Paris São Paulo Singapore  
Sydney Tokyo Toronto

al Statements

nsidered  
r of less  
ong the  
mpanies  
in-store  
substan-  
heavy  
r—must  
ers and  
it.

# 22

## Ratios in Industry Analysis

### Comparing Companies with Related Groups

Securities can neither be analyzed nor valued in a vacuum. The analytical function requires that a company be compared both with companies of a similar nature and with stocks in general to determine the characteristics and attractiveness of the individual issue. In general, individual companies are grouped together by

- Traditional industry definitions, such as soft drinks or automobiles
- Economic sectors, such as consumer nondurable goods
- Sensitivity to some economic factor, such as interest rates
- Market sector, such as low-priced stocks or growth stocks

Before making any forecast, the analyst must understand how the company makes money. Profit comes from adding value to the inputs (labor, raw materials, etc.). The value added arises from increasing the utility through changing the form, location, size, convenience, appearance, or some other characteristic of the original inputs in a way that makes the product or service more desirable.

Thus, the analyst must understand the workings of the industry in which the company operates and competes. A company's competitors must be understood, for they are a part of the operating environment. Analysts tend to compare stocks in a "peer group," such as an industry, with others in the group to a greater degree than with the market as a whole.

Before the valuation the analyst will try to determine which companies have done better or worse than the group, and more important, why. It is a great convenience to devise some measure of what has been "normal" or average performance for the group, as a yardstick against which each company can be compared. Because of the difference in the size of the companies, ratio analysis has become the most common tool for measuring the tangible record of the companies and the industry on a basis independent of size. The modest objectives of this chapter are to provide sample displays of industry data, and to discuss some of the uses of averages, indexes, and other techniques, along with some of their disadvantages.

Analysts face many challenges in preparing the data for a company so that its ratios are consistent through time and comparable with other companies under consideration. In addition, preparing an industry "average" or benchmark ratio against which to compare the other companies presents some technical complications.

## Seven Grocery Chains

### Ratio Tables

To provide a basis for discussion of alternative techniques and their strengths and weaknesses, a number of tables of ratios have been prepared on seven grocery chains. The grocery industry was chosen because of its homogeneity and because all readers should be generally familiar with its retailing activities. The list of companies includes very large and very small companies, some with high profitability and others with low, and companies of disparate qualitative characteristics.

### Original Data Adjusted for Operating Leases

In preparing the data for industry ratio analysis, each company was treated in accordance with the recommended adjustments discussed in Chapters 10 through 19. The rent schedules of operating leases were projected and discounted at a 10 percent rate. The resulting present value was capitalized as an asset and a lease liability. The present value is *principal* and the remainder of the operating lease rental payments is *interest*. The ratio of this interest component to the total rental payments was assumed to be constant for all years, and therefore, the interest expense for operating leases for each year was calculated as the interest ratio multiplied by the year's total operating lease rental expense. These steps put the equity ratio and the return on total capital on a more

### Ratios in Industry Analysis

comparable basis than would be capitalized. Some error is introduced by the estimated discount rate, but because the bias is in the same

### FIFO Inventories

At the beginning of the 10-year period, all companies were on a LIFO basis. Some companies used LIFO. Because of the change in inventory method, and proper LIFO for the early years, all of the years studied.

### Other Adjustments

Where interest had been capitalized, amortization and tax effect were unusual and nonrecurring and were eliminated or moved to years reported. Goodwill was eliminated. Where a company had foreign currency, the information was available for conversion. Other than the capitalization of goodwill, for these companies it was assumed that they could have been ignored. Whether the aggregate sum of these adjustments made a material difference until the

### The Industry Is Changing

A few decades ago, grocery activities and characteristics of the industry were used to discuss margins, sales growth, and return on capital per store, square feet of retail space, and of retailing space on a company's balance sheet. In recent years, nearly all grocery stores have moved into the grocery store, and some acquired drug stores and combination store concepts. The industry has grown from 10,000 three decades